

<i>Presence/Absence Models</i>							
model	formula	BIC	Model prob.	D²	OOS model prob.	OOS classification error (DENV)	OOS classification error (CHIKV & ZIKV)
PA1	pa ~ lpop*DEN - DEN	1444	0	0.382	0	0.224	0.309
PA2	pa ~ (propTGDP + lGDP + lpop)*DEN - DEN	1644	0	0.469	0	0.142	0.434
PA3	pa ~ (R0.GR0+lpop)*DEN - DEN	1465	0	0.461	0	0.093	0.338
PA4	pa ~ (R0.GR0 + propTGDP + lGDP+lpop)*DEN - DEN	1375	0.008	0.505	0.01	0.118	0.342
PA5	pa ~ R0.GR0 + propTGDP + (lGDP+lpop)*DEN - DEN	1365	0.992	0.503	0.99	0.12	0.351
PA6	pa ~ R0.GR0.alt*DEN - DEN	1455	0	0.432	0	0.096	0.337

<i>Incidence Models</i>							
model	formula	BIC	Model prob.	D²	OOS model prob.	OOS mean absolute percentage error	
IM1	l.inc ~ lpop*DEN-DEN	2593	0	0.465	0	0.169	
IM2	l.inc ~ (propTGDP + lGDP + lpop)*DEN-DEN	2559	0	0.506	0	0.169	
IM3	l.inc ~ (R0 + lpop)*DEN-DEN	2484	0	0.55	0	0.148	
IM4	l.inc ~ (R0.alt)*DEN-DEN	2433	0.052	0.595	0.058	0.14	
IM5	l.inc ~ (R0 + propTGDP + lGDP + lpop)*DEN-DEN	2427	0.948	0.595	0.942	0.14	
IM6	l.inc ~ (R0 + propTGDP + lpop)*DEN + lGDP -DEN	2501	0	0.531	0	0.153	

Table S4: Generalized linear models used to validate the $R_0(T)$ model. Presence/absence models used a Binomial distribution and incidence models used a Gamma distribution. “- DEN” indicates that separate y-intercepts were not fit for DENV versus CHIKV/ZIKV (only interaction terms). Abbreviations used in the table are listed below.

Model terms and abbreviations

OOS = out-of-sample

BIC = Bayesian Information Criterion

Model prob. = model probability based on BIC

D^2 = deviance explained

pa = presence-absence

lpop = log(population size)

DEN = indicator of DENV (DEN = 1) or CHIKV or ZIKV (DEN = 0); -DEN indicates that the main effect for this term was not included

lGDP = log(gross domestic product)

propTGDP = proportion of GDP in tourism

R0.GR0 = $\text{Prob}(R_0(T) > 0)$

R0.GR0.alt = $\text{Prob}(R_0(T) > 0) * \log(\text{population size})$

l.inc = log(incidence) for incidence > 0

R0 = $R_0(T)$

lR0.alt = $\log(R_0(T) * \text{population size})$